

REMARKS

This application has been reviewed in light of the Office Action dated November 5, 2004. In view of the foregoing amendments and the following remarks, favorable reconsideration and withdrawal of the objection and rejections set forth in the Office Action are respectfully requested.

Claims 1, 6-7, 9-13, 18-19, and 21-31 are pending in this application. Claims 1, 13 and 25 have been amended. Claims 26-31 have been added. No new matter has been added. Claims 1, 13 and 25 are in independent form.

Claim 25 was objected to as being in improper dependent form. That claim has been rewritten in independent form. Withdrawal of this rejection is respectfully requested.

Claims 1 and 13, along with certain dependent claims, were rejected under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent No. 6,240,384 (*Kagoshima*) in view of U.S. Patent No. 4,980,916 (*Zinser*). The remaining dependent claims were rejected under 35 U.S.C. § 103(a) over *Kagoshima* in various combinations with *Zinser*, U.S. Patent No. 5,913,193 (*Huang*), U.S. Patent No. 6,366,883 (*Campbell*), and U.S. Patent No. 6,490,563 (*Hon*). Applicants respectfully traverse these rejections.

Applicants submit that, for at least the reasons set forth below, the independent claims patentably distinguish the invention over all of the cited art, and Applicants request reconsideration and withdrawal of the § 103 rejections.

Independent Claim 1 recites, *inter alia*, distortion obtaining means for obtaining a respective modification distortion for each of a plurality of synthesis units, each respective modification distortion being a distortion between a respective unmodified individual synthesis

unit and the individual synthesis unit after modification. Each of independent Claims 13 and 25 includes a corresponding feature.

Applicants wish to direct the Examiner's attention to the accompanying diagrams, in order to explain at least one important way in which the claimed invention differs from *Kagoshima* and *Zinser*. In the accompanying diagrams, Fig. (a) represents an aspect of *Zinser*, Fig. (b) represents an aspect of *Kagoshima*, and Fig. (c) represents an aspect of the claimed invention.

As shown in Fig. (a), according to *Kagoshima*, a unit is modified in an attempt to approach the target unit, whereby candidates are generated (shown by (1) in the figure). Then, each generated candidate is compared to the target unit (shown by (2) in the figure).

As shown in Fig. (b), according to *Zinser*, input speech itself is the target, and characteristics of the input speech are used to generate various candidates (shown by (1) in the figure). Then, each generated candidate is compared to the input speech (shown by (2) in the figure).

As shown in Fig. (c), according to the claimed invention, neither a target unit nor input speech is employed. Rather, each of the synthesis units is modified to generate candidates (shown by (1) in the figure). Then, each of the synthesis units (as it had existed before being modified) is compared to the respective corresponding candidate, i.e., the synthesis unit after modification (shown by (2) in the figure).

In contrast, *Zinser*'s candidates are not the input speech after modification. Thus, it is submitted that *Zinser* does not teach or suggest a "modification distortion being a distortion

between a respective unmodified individual synthesis unit and the individual synthesis unit after modification,” as recited in independent Claim 1.

The above-discussed distinction between the claimed invention and *Zinser* is explained in more detail in the following.

The Office Action (page 4) cites *Zinser* as teaching “a pitch error minimizer, which compares a pitch-altered synthesized speech sequence to an input or unmodified sequence to determine a distortion (error) (Col. 3, Lines 5-37).” Based on this teaching, the Examiner deems *Zinser* to teach “that the modification [distortion] obtained [is a distortion] between an unmodified individual synthesis unit and the same individual [synthesis] unit after modification” (page 4).

However, as stated above, Applicants submit that *Zinser* does not teach a “modification distortion being a distortion between a respective unmodified individual synthesis unit and the individual synthesis unit after modification,” as recited in independent Claim 1. Specifically, *Zinser* is understood to compare an input signal A with an output signal D that is a different signal from the input signal; the output signal is not the input signal after modification.

As explained in *Zinser*, the basic technique employed therein comprises searching a codebook of randomly distributed excitation vectors for the vector that produces an output sequence (when filtered through pitch and linear predictive coding (LPC) short-term synthesis filters) that is closest to the input sequence (col. 1, lines 35-40). *Zinser* improves on this basic technique.

According to *Zinser*’s method, an input signal A is analyzed in an LPC analysis circuit 10 to produce a set of linear prediction filter coefficients. The linear prediction filter

coefficients and parameters representing an excitation sequence comprise coded speech that is transmitted to a receiving station. The linear prediction filter coefficients and excitation sequence are derived at the receiving station and provided to a matching linear predictive synthesis filter in order to synthesize an output waveform D that closely resembles the original speech. Col. 2, lines 37-57, Figs. 1 and 2.

Linear predictive synthesis filter 11 is used in the transmitting portion of the system to generate excitation sequence "C". More specifically, a Gaussian noise codebook 12 is searched to produce an output signal "B" that is passed through a pitch synthesis filter 13 that generates sequence "C." Weighting filters 14a and 14b each receive the linear prediction filter coefficients from LPC analysis circuit 10. Filter 14a also receives the output signal of LPC synthesis filter 11 (i.e., waveform "D") and filter 14b also receives the input speech signal (i.e., waveform "A") The difference between the output signals of filters 14a and 14b is generated in a summer 15 to form an error signal. This error signal is supplied to a pitch error minimizer 16 and a codebook error minimizer 17. Col. 2, line 58 - col. 3, line 4.

Using the minimizers 16 and 17, the error from summer 15 is minimized, such that the waveform produced at "C" causes LPC synthesis filter 11 to ultimately produce an output waveform at "D" that closely resembles the waveform at "A." Col. 3, lines 5-26.

Thus *Zinser* is understood to extract characteristics of input signal A and then use those characteristics in producing an output signal D resembling original speech signal A, by searching a codebook to find an excitation vector that produces an output sequence closest to A. Output signal D is an entity distinct from, although resembling, input signal A. Accordingly, *Zinser* is not understood to suggest a "modification distortion being a distortion between a

respective unmodified individual synthesis unit and the [same] individual synthesis unit after modification,” as recited in independent Claim 1.

As has been explained above and in the previous amendments, *Kagoshima* is not understood to compensate for the above-discussed deficiencies of *Zinser* with respect to the claimed invention.

Since neither *Kagoshima* nor *Zinser*, whether taken singly or in combination (even assuming, for the sake of argument, that such combination were permissible), contains all of the elements of independent Claim 1, that claim is believed allowable over the cited art. Since each of independent Claims 13 and 25 recites features similar or identical to those of Claim 1, those claims are believed allowable for at least the same reasons.

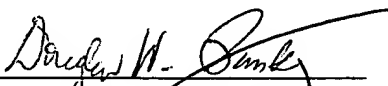
A review of the other art of record, including *Huang*, *Campbell* and *Hon*, has failed to reveal anything which, in Applicants’ opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to the address listed below.

Respectfully submitted,



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